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## ANTHRAX!!

The events of September 11 have changed everything in ways that are hard to imagine. Before September, threats of biological warfare were subjects of planning, training and execution, just in case the unimaginable happened. But it did happen. The first diagnosed case of anthrax was from a Florida resident, Robert Stevens. North Carolina was drawn into the story because he had visited the state for several days prior to his death. This began an intensive investigation of medical records in the areas of the state where he visited. This investigation involved public health officials from the Centers for Disease Control and Prevention (CDC), state and local health departments. They worked with private hospitals and physicians in four counties. There were 19 hospitals involved in the study. Charts dating back to September 11 were reviewed for specific criteria established by CDC and NC Department of Health and Human Services (DHHS). These criteria included syndromes associated with anthrax plus specific laboratory data. No cases were found in North Carolina during that investigation. Every hospital, clinic and health department in the state is now involved in the ongoing surveillance for potential new cases of this infection. Clinical laboratories will play a pivotal role in the rapid identification of the bacteria.

*Bacillus anthracis*, the causative agent of anthrax, occurs naturally in the environment, but transmission to humans is usually through occupational contact with infected animals or animal products. This naturally-occurring anthrax usually involves the skin (cutaneous anthrax). Inhalation anthrax results from inhaling *B. anthracis* spores and is most likely found following an intentional aerosol release. Morphological characteristics of the organism include:

**Growth:** Grows on 5% sheep blood agar @ 35-37° C; will not grow on MacConkey agar

Colonies appear 2-5 mm in diameter, flat to slightly convex with irregularly rounded edges ("ground glass" appearance). They may have comma-shaped protrusions (Medusa head colonies) at the colony edge.

Colonies are non-hemolytic (weak hemolysis may be observed under areas of confluent growth but should not be confused with beta hemolysis).

**Gram stain:** Broad, gram-positive rod (1-1.5 x 3.5µ) that forms oval, central to subterminal spores with no significant swelling of the cell.

**Motility:** *B.anthraxis* is a non-motile species.

Hospitals and other clinical laboratories in North Carolina should conduct appropriate lab work-up on clinical samples. Contact the NC State Laboratory of Public Health (NCSLPH) should suspicious organisms be noted. The SLPH will perform confirmatory tests. Since September 11, approximately 25 clinical isolates have been submitted to the SLPH to confirm or rule out anthrax; all specimens have been negative. Environmental samples are also being screened. The CDC is recommending that only the SLPH be used to conduct testing of environmental samples for anthrax. This testing requires a BSL-3 testing facility (Biological Safety Laboratory- level 3). Since October 7, the SLPH has received 250+ environmental samples to test; over 200 of these have been processed. All have been negative for *B. anthracis*.

Information regarding testing may be obtained from the Microbiology Unit at 919-733-7367 or from the Director's Office at 919-733-7834.

A new era in laboratory testing has begun.

Vickie Whitaker, Chief  
Laboratory Improvement

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## West Nile and other Arbovirus Activity in North Carolina

West Nile Virus originates from Africa and is also found in Europe and West Asia. It was first found in the United States in the summer of 1999 in New York City. Since then the virus has spread down the eastern seaboard of the United States and to midwestern and gulf states. With the addition of North Carolina, at least 25 states and the District of Columbia have now reported evidence of the virus.

West Nile Virus was first detected in North Carolina in October, 2000. It was found in a dead crow submitted from Jordan Lake State Park in Chatham County. The first case in 2001 was identified in September, and as of November 1, the total of non-human cases is 12. These include:

- two blue jays (Cabarrus County),
- six crows (Camden, Currituck, Mecklenburg and Chowan Counties),
- and one horse (Hyde County).

Two sentinel chickens from different locations in Hyde County plus one chicken in Pitt County have also seroconverted to West Nile Virus. As of November 1, there have been no human cases of West Nile Virus in North Carolina.

At the State Laboratory of Public Health, a new specialist has joined the Virology unit. Katharine (Kate) Volpe comes to the State Laboratory from the Centers for Disease Control and Prevention (CDC). She was with the Division of Vector Borne Infectious Disease, Arbovirus Disease Branch in Fort Collins, CO from November 1998 to July 2001. During that time she worked as both a visiting fellow and a laboratory technician. She gained experience with several arboviruses, including West Nile. Her responsibilities here include clinical diagnosis of human, veterinary, avian and mosquito specimens for arboviral agents.

NC State Laboratory of Public Health  
Correspondence may be mailed to:  
Laboratory Improvement, PO Box 28047, Raleigh, NC 27611

The following chart summarizes the arboviral activity in NC through November 1, 2001:

Type Specimen	Number Tested	Number Positive
Veterinary non-avian	64	12 (1 WNV + 11 EEE)
Avian	99	8 (All WNV)
Human Arboviral Surveillance	242	14 (All LAC)
Mosquito Surveillance	747	2 (Both EEE)
Sentinel Chicken Surveillance	2409	28 (25 EEE+3WNV)

Codes: WNV = West Nile Virus

EEE = Eastern Equine Encephalitis

LAC = LaCrosse

For more information on arboviral testing, including West Nile Virus, contact Kate Volpe or Todd McPherson at 919-733-7544.

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### **Environmental Protection Agency Meeting**

The Environmental Sciences Unit of the NC State Laboratory of Public Health (NCSLPH) in conjunction with the Water Quality Section of the Department of Environment and Natural Resources (DENR) jointly hosted the Environmental Protection Agency (EPA) Region 4 annual meeting on October 17 and 18 in Raleigh. The meeting was held in the Daniels Auditorium at the Museum of History with break-out meetings held at the NCSLPH building. Over 50 scientists were in attendance, including EPA representatives from Cincinnati and Athens, as well as state representatives from South Carolina, Alabama, Mississippi, Georgia, Kentucky and Florida.

During the meeting, EPA representatives discussed the potential for false positive and negative results in Inductively Coupled Plasma (ICP) metals analysis; Decreasing Detection/Quantitation Limits, specifically identifying key areas of appropriate method and instrumentation and clean glassware and laboratory environment. A Drinking Water Methods and Laboratory Certification update presentation discussed the Alternate Test Procedure (ATF) program, recently promulgated regulations on Disinfection By-Products, the Unregulated Contaminants Monitoring Rule (UCMR), Radionuclides, Ground Water Regulations and future proposed regulations on arsenic and radon.

Representatives from the South Carolina DEHC office presented findings of a continuing investigation into the presence of uranium and radon in drinking water in their state. Interestingly, this study began as the result of finding Uranium 238 in a hair sample from a single homeowner in the upper Piedmont area of South Carolina.

The first day concluded with laboratory tours of the NC Drinking Water and Wastewater facilities.

The second day of the meeting consisted of small group discussions in the general areas of organic testing, inorganic methodologies, QA/Laboratory certification and laboratory directors. Summaries of each group discussion were presented to all attendees.

The next meeting will be held at the EPA complex in Athens, GA, in the fall of 2002.

Cindy Price  
Laboratory Certification Officer

### **CLIA Update**

Did you know CLIA has its own “Top Ten List”? Let’s take a look at the ten deficiencies that were cited most often by the North Carolina State Agency surveyors in the labs that we have surveyed so far this year.

1. The laboratory director must ensure that an approved procedure manual is available to all testing personnel for any aspect of the testing process.
2. Each laboratory must establish and follow written policies and procedures for a comprehensive quality assurance plan to monitor and evaluate the ongoing and overall quality of the total testing process.
3. The laboratory must follow manufacturer’s instructions for instrument or test system operation and test performance.
4. The laboratory must perform and document control procedures using at least two levels of control material each day of testing.
5. The laboratory director must ensure the establishment and maintenance of acceptable levels of analytical performance for each test system.
6. The record system must include the identity of the personnel who performed the test(s).
7. The laboratory director must specify, in writing, the responsibilities and duties of all personnel indicating which procedures the person is authorized to perform, whether supervision is required, and whether review is required prior to result reporting.
8. The laboratory must maintain a copy of all proficiency testing records, including report forms used to record results and signed attestation statements, for a minimum of two years from the date of the proficiency testing event.
9. The laboratory director must ensure that policies and procedures are established for monitoring the competency of all testing personnel for all phases of the testing and reporting process.
10. The test report must indicate the name and address of the laboratory location at which the test was performed, the test result, and, if applicable, the units of measurement.

In the August issue of the CLIA Network Newsletter, an update from the CLIA database was presented which compared the same laboratories over the first, second, and third survey cycles. It is noteworthy that:

- the percentage of laboratories with repeat deficiencies (the same deficiency cited during more than one survey cycle) has decreased
- the top three deficiencies have remained constant
- the top three deficiencies on the national list are numbers 2,3, and 4 on our list.

We hope our “Top Ten List” will be a useful tool as you are preparing for your next CLIA survey. Please give us a call at (919) 733-1610 if you have any questions. To access the CLIA website: [www.hcfa.gov/medicaid/clia/cliahome.htm](http://www.hcfa.gov/medicaid/clia/cliahome.htm).

Shannon Simpson  
Laboratory Consultant

### **Pulsed Field Gel Electrophoresis Laboratory Activities, September 2001**

The North Carolina State Laboratory of Public Health (NCSLPH) has a pulsed field gel electrophoresis (PFGE) laboratory which participates in PulseNet, the national molecular subtyping network for foodborne pathogens. The goal of this network is to quickly identify outbreaks that may cross state lines to prevent further spread of disease. Currently, we are able to subtype *E. coli* O157:H7, *Listeria monocytogenes*, *Salmonella* sp., and *Shigella sonnei* isolates using standardized PFGE methods. All *E. coli* O157:H7 and *L. monocytogenes* isolates should be sent to this laboratory for subtyping due to the serious complications of these illnesses.

We are fortunate to have a new Laboratory Medical Specialist in the PFGE laboratory, Denise Briggs, BSMT(ASCP). Denise has been with us for approximately two months and has been a great addition to the laboratory. In addition to expanding our staff, the laboratory is also acquiring a second electrophoresis system, known as CHEF Mapper, in order to process more isolates for outbreak investigations and surveillance purposes. With these two additions, the capacity to detect low-level outbreaks and to perform surveillance on our most common *Salmonella* serotypes, such as *typhimurium*, *newport*, and *javiana*, is greatly increased.

Of particular interest this year, has been a large increase in *S. enteritidis* cases beginning in January 2001 and continuing through the spring and summer months. *S. enteritidis* is most commonly associated with consuming undercooked, contaminated eggs. Normally, subtyping by PFGE is not routinely performed due to the clonal nature of this organism; that is, the PFGE patterns closely resemble each other despite different sources of the isolates. This year, however, new sources of infection were identified to be almonds sold through natural food stores and cajun beef jerky produced by Sara Lee. Many other states reported outbreaks of *S. enteritidis* as well, so all PulseNet participants were asked to subtype *S. enteritidis* isolates to determine if there were new or common patterns emerging. While there seemed to be two very common patterns, the pattern associated with eating contaminated almonds was unique.

In July and August of 2001, North Carolina had another surge in *S. enteritidis* cases spread throughout the state. Most cases had no common source, so the CDC sent a team of epidemiologists ("EpiAid") to assist our state epidemiologists in the outbreak investigation. In hopes of separating sporadic cases from true outbreak cases of *S. enteritidis*, all isolates from July, August and early September were subtyped. Two very common pattern were found, but also new patterns previously not seen by the CDC PulseNet database administration team. The outbreak investigation continues, but the epidemiologists believe the PFGE pattern designations assigned by NCSLPH to each isolate will be critical to discovering the likely source of the outbreak.

For any questions regarding submission of isolates for PFGE analysis or for general information about PulseNet, please feel free to contact Leslie Wolf or Denise Briggs at 919-733-7367.

Leslie Wolf, PhD  
Research Scientist

## Safety training takes on 'Survivor' theme, But Will Tina or Colby be there?

No one said that safety training was supposed to be fun, but there aren't any rules that say it can't be, either.

Stealing a cue from the wildly popular reality show *Survivor*, the folks at the State Public Health Lab have found a way to combine their need to operate safely with their desire to make safety training interesting.

The only drawback may be that the contest takes place at the State Lab in Raleigh rather than by an exotic riverside setting in the Outback of Australia.

"Mandatory safety training can feel like torture, so we try to think of innovative ways of having fun while we learn," said Kristy Osterhout, laboratory improvement consultant. "Last year we played Safety Jeopardy, complete with an Alex LabTech."

This year the State Lab's annual safety training was the game Survive — an idea dreamed up by Laboratory Improvement Consultant Cherry Horn. The contestants wore tropical attire and the classroom was turned into an island complete with tiki torches and an alligator filled lagoon. The training lasted about two hours and covered general safety, office safety, ergonomics, HazCom, bloodborne pathogens, chemical hygiene, personal protective equipment, fire and emergency.



Each game had three teams of 10 or fewer participating in different challenges of skill and knowledge. If a challenge was answered incorrectly the contestant was voted off the island and had to observe the remainder of the game as a prisoner of the Big Kahuna. The surviving team or contestant won \$100,000 candy bars!

"We tried to find the most important safety issues for the lab and devise safety challenges based on these issues," Osterhout said. "Each team was given the opportunity to answer questions or demonstrate proficiency relating to each of these safety issues."

**Yes, but what we want to know is what kind of bugs will they have to eat?**



***Laboratory Holiday Schedule***

The State of North Carolina will observe the upcoming **2001** holidays:

<b>Holiday</b>	<b>Observance Date</b>	<b>Day of Week</b>
Christmas	December 24, 25 & 26	Monday, Tuesday & Wednesday

During the holidays, the State Laboratory of Public Health will conduct some testing, but please check with the appropriate areas listed below **prior** to the holidays regarding specimen shipment during this time. By calling first, the laboratory can ensure that all specimens are processed appropriately and thus avoid unsatisfactory specimens and delays.

Cancer Cytology	919-733-7146
Environmental Sciences	919-733-7308
Microbiology	919-733-7367
Newborn Screening/Clinical Chemistry	919-733-3937
Virology/Serology	919-733-7544

It is also imperative that you contact the State Courier representative for your area to determine their holiday schedule and pick-up times. Laboratory personnel cannot be responsible for time-sensitive specimens that do not arrive due to limited courier activity.

Please keep the following 2002 Holiday Schedule for reference.

**2002 Holiday Schedule – North Carolina State Government**

<b>Holiday</b>	<b>Observance Date</b>	<b>Day of Week</b>
New Year's Day	January 1	Tuesday
Martin Luther King's Birthday	January 21	Monday
Good Friday	March 29	Friday
Memorial Day	May 27	Monday
Independence Day	July 4	Thursday
Labor Day	September 2	Monday
Veteran's Day	November 11	Monday
Thanksgiving	November 28 & 29	Thursday & Friday
Christmas	December 24, 25 & 26	Tuesday, Wednesday, & Thursday

